case of Germany and the USA, 8 in Denmark, and up to 10 layers in Japan.

The direction of the sense of each tape layer alternates with each layer, with a diameter between conductors ranging from 3.0 cm to 4.0 cm. The superconducting tapes are applied with a lay length (L) from 50 cm to 100 cm (Figure 4) in order to observe the behavior of the cable critical characteristics. In tests conducted on short segments of cables, independently of the design parameters (diameter and lay length), the current distribution between layers is relatively uniform, the superconducting section is [used] totally used and the maximum values of critical current are obtained in the tests. [In fact, values] Values of 5800 A - 12000 A have been reached in short segments of cable.

IN THE CLAIMS

Please cancel claims 1-11, and replace with the following:

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12) A flexible superconducting core for a superconducting power cable, said core comprising:

a) a helical externally corrugated flexible central core element comprised of stainless steel;

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b) a stainless steel core mesh positioned around said corrugated flexible central core element to provide a relatively flat surface, said mesh consisting of:

i) a first layer of steel tape of one size; and

ii) a second layer of steel tape having a different said size from said first layer;

c) a layer of at least one copper tape, positioned on top of said stainless steel core

mesh;

d) a plurality of superconducting tapes layered over said at least one said copper tape, one section of a layer of the superconducting tapes positioned next to the central core being wound in one direction opposite the other section of said superconducting layers wound on top of said other layers closest to said layer of said copper tape, wherein a laying length of all the layers varies from a maximum P_{max1} (1000 cm) and P_{max2} (1000 cm) in the intermediate layers and a P_{min1} (2 cm) and P_{min2} (2 cm) in the external layers, while the laying angle of the tapes in all of the layers varies from α_{max1} (45 degrees) to α_{min1} (0 degrees) and from α_{max2} (45 degrees) to α_{min2} (0 degrees) in at least one of the layers of tapes placed between the external surface of the core and the inferior part of the layer, being the current distribution between the layers uniform and each cable layer operating at total current conductance.

13) The flexible conductor core according to claim 1, wherein said tube element has an external diameter of preferably between 4 and 6 cm , an internal diameter between 2 and 4 cm, a corrugation depth ranging between 0.5 cm and 1 cm, and a corrugation pitch between 1.6 and 3 cm.

14) The flexible conductor core for claim 1, wherein the stainless steel tapes for said first layer has a width between 4 cm and 5 cm and a thickness between 0.005 to 0.006 cm and spacing ranging from 0.15 to 0.2 cm and the second layer of stainless steel tape is applied which has a width ranging from 2.5 to 4 cm ~~and the second layer~~

of stainless steel tape having a width ranging from about 2.5 to about 4 cm and a thickness ranging from 0.001 to 0.002 cm with a spacing ranging from 0.1 to 0.15 cm.

15) The flexible conductor core for a superconducting power cable according to claim 1, wherein the tubular core consists of a first layer of copper tapes with a width ranging from 0.25 cm to 4.0 cm and a thickness ranging from 0.025 to 0.030 cm with a laying length ranging from 2 to 100 cm.

16) The flexible conductor core for a superconducting power cable according to claim 1, wherein said core operates with a current selected from the group consisting of direct current, alternate current, current pulses and combinations thereof.

17) The flexible conductor core for a superconducting power cable according to claim 1, wherein the conductor layers are made of metals and/or alloys with low electric resistance based on a metal selected from the group consisting of aluminum, copper and silver.

18) The flexible conductor core for a superconducting power cable according to claim 1, wherein the layers are made of one or several superconducting tapes, and the directions of the laying length of the tapes from the internal layer to the external layer change only once independently of the number of the layers of the cable.